



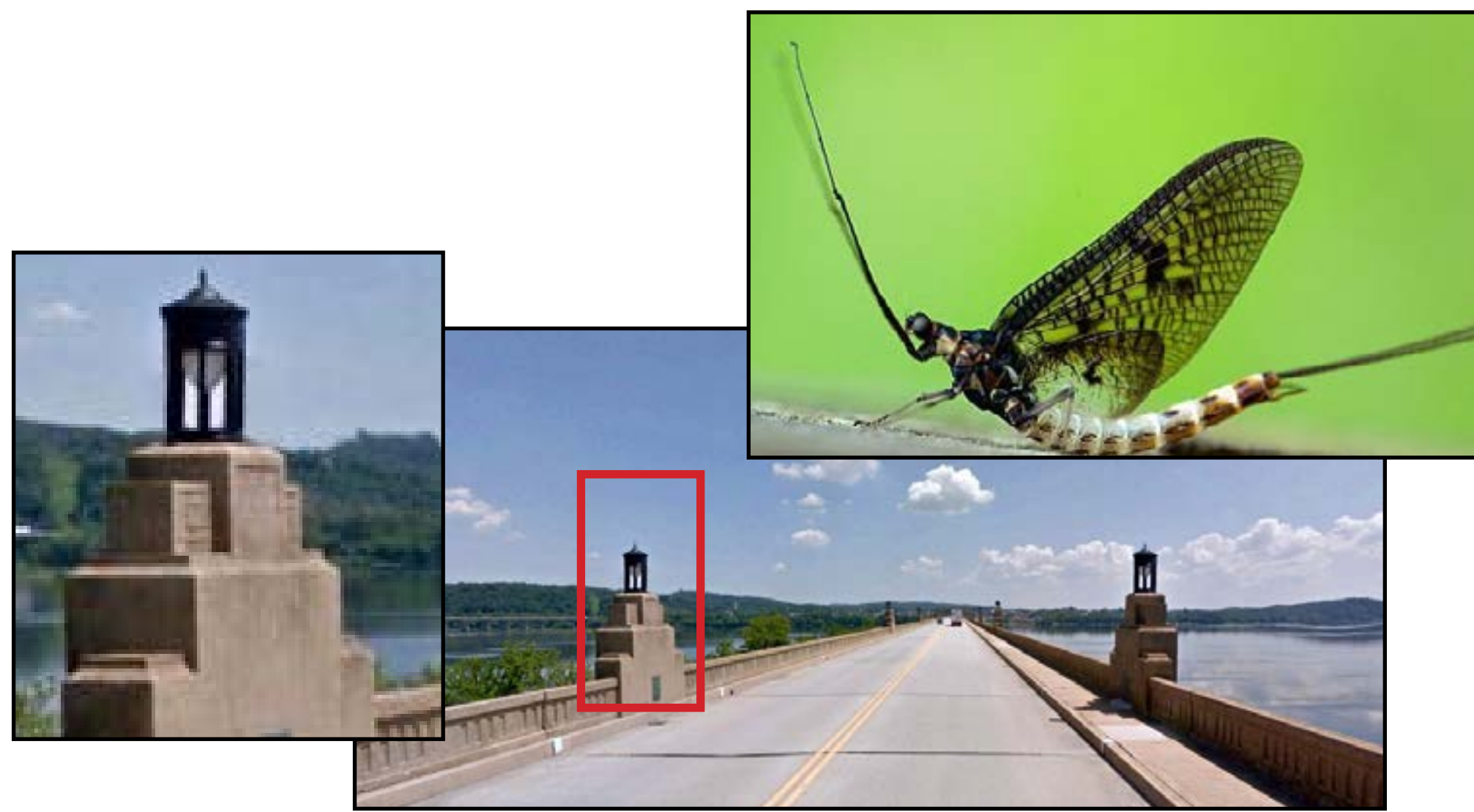
# COLUMBIA-WRIGHTSVILLE BRIDGE REHABILITATION PROJECT

## VETERANS MEMORIAL BRIDGE OVER THE SUSQUEHANNA RIVER

### MAYFLIES AND LIGHTING

#### BENEFITS

- ▶ Mayflies are indicators of good water quality in the river
- ▶ In 2013 historic replicated lighting was installed on the bridge, replacing the 1970's high mast arm lighting



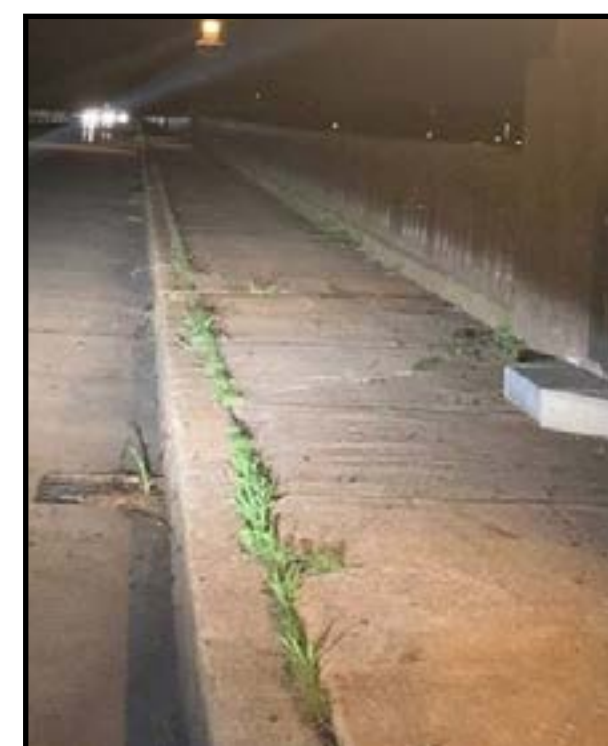
#### THE PROBLEM

- ▶ An unforeseen effect was luring swarms of mayflies to the bridge's above deck lighting inhibiting visibility between late June and early August
- ▶ The mayflies intensity resulted in vehicle crashes due to slick surfaces, became a general nuisance to all modes of travel, and created maintenance issues
- ▶ An interim solution has been turning the lights out during the mayfly hatching season, limiting visibility for users between dusk and dawn



#### LIGHTING AND MAYFLIES STUDY

- ▶ Light testing studies were performed at the Columbia-Wrightsville Bridge between June and August 2020
- ▶ During the testing period, modifications to the existing lighting or placement of additional lighting occurred during evenings of mayflies swarming in order to observe how the mayflies interacted with the lighting variations of intensity, colors and location



Video cameras were used to collect data on mayfly swarms throughout the evening

Mayfly deposits at the base of light after one night - existing fixtures

Mayfly deposits on bridge and sidewalk after 2 hours - existing fixtures

Mayfly deposits on bridge and sidewalk after 2 hours - new fixtures

Taken from Columbia River Park showing cooler (white colored- existing fixtures in distance) and warmer (yellow colored- new fixtures @ 2 locations) and green under bridge test lighting

#### STUDY RESULTS

- ▶ On May 6, 2021, research results and lighting options from the 2020 summer mayflies and lighting study was shared with Columbia and Wrightsville Boroughs and West Hempfield Township. The options included:
  - **Modify Above Bridge Lighting** - Replace the LED lights within the existing historic lantern light fixtures to a dual color system. This beneficially produces a set of yellow/amber light (to be used during mayfly seasons to minimize attraction) and warm white light (to be used outside of mayfly season), which is a more familiar and ideal illumination for motorists, bikes and pedestrians.
  - **Add Under Bridge Lighting** - add colored under-bridge lighting along the river arch spans. The benefit of using colors, particularly green, acted as an attractant with intention of drawing most mayflies to be closer to the natural river surface.
- ▶ Columbia Borough, as the current owner/maintainer of the above deck bridge lighting system per an existing bridge lighting maintenance agreement, along with Wrightsville Borough and West Hempfield Township, ultimately expressed in a collective decision that the additional energy and maintenance costs from adding under bridge lighting could not be absorbed into their local budgets. PennDOT also respectfully indicated it could not participate at a higher level of funding than the existing maintenance agreement as it would negatively impact the Lancaster County Maintenance budget, used for numerous priorities and responsibilities county-wide.

#### SOLUTION

- ▶ The project will include modifying the above deck bridge lighting. This will maintain approximate energy and maintenance costs to the existing lighting system, while providing a reasonable degree of mitigation towards the annual mayflies issue. This potentially benefits the municipalities by not having to fully turn off the lights for the extended period each year, in turn improving the lighting situation for the three travel modes.
- ▶ Plans will also include considerations to facilitate an easier lighting retrofit, should the municipalities want to install under bridge lighting in future years